

What is claimed is:

- 1 1. A method of operating a service network connected to an
2 access network infrastructure shared with other service networks, comprising the
3 steps of:
4 receiving, at a tunneling endpoint in the service network, an
5 encapsulated packet from an access network device connected to the access
6 network infrastructure and related to services offered by the service network;
7 de-encapsulating the packet;
8 if the access network device is associated with an authorized
9 subscriber to services offered by the service network, forwarding the packet to a
10 destination network address indicated in the packet. thereby effectuating the
11 services offered by the service network.
- 1 2. The invention of claim 1 wherein the tunneling endpoint is a
2 router and the packet is de-encapsulated using a layer three tunneling technique.
- 1 3. The invention of claim 2 wherein the layer three tunneling
2 technique is IP within IP encapsulation.
- 1 4. The invention of claim 2 wherein the layer three tunneling
2 technique is minimal IP encapsulation.
- 1 5. The invention of claim 1 wherein the tunneling endpoint is a
2 layer two tunneling network server and the packet is de-encapsulated using a layer
3 two tunneling technique.
- 1 6. The invention of claim 5 wherein the layer two tunneling
2 technique is L2TP.
- 1 7. The invention of claim 1 wherein the service networks utilize
2 the Internet Protocol and wherein the addresses are Internet Protocol addresses.

1 8. The invention of claim 1 wherein the service network is
2 operated by an Internet Service Provider different from an entity operating the
3 access network infrastructure.

1 9. The invention of claim 8 wherein the service networks are
2 operated by different Internet Service Providers.

1 10. The invention of claim 8 wherein the service networks offer
2 access to different Internet Protocol-based services.

1 11. The invention of claim 1 wherein the access network
2 infrastructure comprises a hybrid fiber coaxial network.

1 12. The invention of claim 1 wherein the tunneling endpoint is one
2 of a plurality of tunneling endpoints in the service network, each having a virtual
3 interface with a network address, and wherein the encapsulated packet is
4 addressed to the network address of the virtual interface.

1 13. A method of operating a network access device connected to an
2 access network infrastructure connected to a plurality of service networks,
3 comprising the steps of:
4 creating a packet related to services offered by a service network;
5 encapsulating the packet and tunneling the packet to a tunneling
6 endpoint in the service network so that the tunneling endpoint can de-encapsulate
7 the packet and forward the packet to its destination network address thereby
8 effectuating the services offered by the service network.

1 14. The invention of claim 13 wherein the tunneling endpoint is a
2 router and the packet is encapsulated using a layer three tunneling technique.

1 15. The invention of claim 14 wherein the layer three tunneling
2 technique is IP within IP encapsulation.

1 16. The invention of claim 14 wherein the layer three tunneling
2 technique is minimal IP encapsulation.

1 17. The invention of claim 13 wherein the tunneling endpoint is a
2 layer two tunneling network server and the packet is encapsulated using a layer
3 two tunneling technique.

1 18. The invention of claim 17 wherein the layer two tunneling
2 technique is L2TP.

1 19. The invention of claim 13 wherein the service networks utilize
2 the Internet Protocol and wherein the addresses are Internet Protocol addresses.

1 20. The invention of claim 13 wherein the service network is
2 operated by an Internet Service Provider different from an entity operating the
3 access network infrastructure.

1 21. The invention of claim 20 wherein the service networks are
2 operated by different Internet Service Providers.

1 22. The invention of claim 20 wherein the service networks offer
2 access to different Internet Protocol-based services.

1 23. The invention of claim 13 wherein the access network
2 infrastructure comprises a hybrid fiber coaxial network.

1 24. The invention of claim 13 wherein the tunneling endpoint is
2 one of a plurality of tunneling endpoints in the service network, each having a
3 virtual interface with a network address, and wherein the encapsulated packet is
4 addressed to the network address of the virtual interface.